

REMARKS

The Examiner's communication dated June 22, 2007 has been received and carefully considered. In conformance with the applicable statutory requirements, this paper constitutes a complete reply and/or a bona fide attempt to advance the application to allowance. Specifically, new claim 5 has been added and detailed arguments in support of patentability are provided. Reexamination and/or reconsideration of the application as amended are respectfully requested.

Summary of the Office Action

Claims 1-4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoneda (U.S. Patent No. 4,614,645) in view of Monro (U.S. Patent No. 5,044,424).

The Abstract

As required by the Examiner, Applicants have amended the abstract so that it is narrative and concise (less than 150 words). Applicants have also removed words such as "means" and "said" from the abstract.

The Subject Application

The subject application relates to economically providing an exhaust smoke processing system in which the heavy metal concentration in exhaust smoke discharged from a smoke stack is reduced. Even if coal is burned or the temperature of exhaust smoke at the inlet of a heat recoverer is varied, the heavy metal concentration in the exhaust gas discharged into the atmosphere can fall within a predetermined range. (See lines 4-8 on page 4 and lines 22-25 on page 15 of the subject application.)

Primary Reference of Record: Yoneda et al.

The Examiner's primary reference is Yoneda et al. (U.S. Patent No. 4,614,645), which discloses a method for treating an effluent in an exhaust gas treating apparatus. With reference to Figure 2 reproduced below, Yoneda et al. specifically discloses a cleaned exhaust gas 9 being sent from an absorption tower to a gas-gas heater 33 wherein the exhaust gas 9 is again heated. Specifically, the cleaned exhaust gas 9 is

Yoneda et al. also discloses that a slurry solution is collected from the exhaust gas and introduced from neutralizing tank 25 through a line 26 into an evaporator 27 disposed above dry dust collector 3. In the evaporator 27, the slurry solution which has come through the line 26 is sprayed through a two-fluid nozzle in order to be changed into tiny droplets. Then, these droplets are mixed with the exhaust gas in the evaporator 27 and are then evaporated. Thus, Yoneda does not teach element 27 as being an air preheater (as asserted by the Examiner); rather, element 27 is an evaporator. *See col. 2, line 28.* Finally, also contrary to the Examiner's reading of Yoneda, no heat medium heat circulation means is taught in the drawings of Yoneda et al.

Claim 1 is defined by, among other, an element that controls heavy metal emission. Specifically, a heat medium circulation pipe passage is provided with temperature control means which measures the heavy metal concentration in exhaust smoke discharged from any one or more of a dust collector, a wet-type exhaust smoke

processing apparatus, and a reheater, and adjusts the temperature of the exhaust smoke at an outlet of the heat recoverer such that the heavy metal concentration falls within a predetermined range. First, Applicant respectfully submits that Yoneda et al. and Monro, separately or in combination, fail to teach or suggest the use of a heat medium circulation pipe passage. Second, Yoneda and Monro each fail to teach or suggest the element that controls heavy metal emission. Both references fail to teach or suggest devices for decreasing or controlling the heavy metal concentration in, for example, the exhaust gas discharged from a wet exhaust gas treating device. For example, Table 1 in Yoneda discloses the properties of the exhaust gas from the pilot plant, in which concentration of heavy metals are not mentioned at all. Also, in Tables 2-4, Yoneda fails to teach or suggest the concentration of heavy metal in the cooling liquid or solution, or the filtrate.

Third, Yoneda explicitly teaches away from the element that controls heavy metal emissions. Yoneda only discloses measuring a concentration of suspended dust material in an effluent from the wet exhaust gas treating device and the amount of said effluent is adjusted such that the concentration of suspended dust material becomes 1-5 wt%. *See column 3, line 54 to column 4, line 6 in Yoneda.* According to the device disclosed in Yoneda, it is impossible to decrease the heavy metal concentration in exhaust gas discharged from a smoke stack.

Fourth, and most importantly, Yoneda and Monro fail to teach or suggest the temperature adjustment means. There is no means for controlling the flow rate of the cleaned exhaust gas. The temperature of the exhaust gas is left to the flow amount in a temperature of an exhaust gas flowing into the system. The temperature of the exhaust gas in an outlet of the absorption tower 8 is 50-48°C, and temperature of the exhaust gas in an outlet of the gas-gas heater 33 is 90-80°C. *See column 7, lines 39-41 of Yoneda.*

In addition, the Examiner tacitly concedes that Yoneda fails to teach a preheater that has gas-gas heat exchange with gas going back into a boiler. This concession is evidenced by the Examiner's reliance on the addition of Monro to Yoneda to reject the pending claims. The Examiner's statement that Yoneda "possibly" does not teach a preheater that has gas-gas heat exchange with gas going back into the boiler is taken

by Applicant to be a concession that Yoneda does not teach this limitation. Should the Examiner disagree, the Examiner is invited to make his rejection stand on Yoneda alone. In adding Monro to Yoneda, the Examiner alleges that it would have been obvious to a person of ordinary skill in the art to have modified the exhaust smoke processing system of Yoneda in view of the teachings of Monro "in order to for [sic] improving the efficiency of such heat generators and for better utilization of heat produced in the thermal section." The Examiner cites column 1, lines 22-26 of Monro for this proposition.

Applicant respectfully submits that this is an invalid reason for supporting the combination of Monroe and Yoneda. More particularly, the Examiner is using conclusory reasoning in combining Monro with Yoneda. In other words, the Examiner has not provided a sufficient reason or explicit analysis of why the disclosures of the references of Monro and Yoneda should be combined. The combination applied against the claims appears to be a classic case of hindsight reasoning. There is simply no suggestion to combine the teachings and suggestions of Monro and Yoneda as advanced by the Examiner, except from using the subject application as a template through a hindsight reconstruction of each of the pending claims. As *KSR* made clear, rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.

The indication that one would modify the teachings of Yoneda with the teachings of Monro in order to improve the efficiency of such heat generators and for better utilization of heat produced in a thermal section is entirely conclusory. Applicant respectfully submits that the Examiner has not adequately provided a sufficient reason or explicit analysis of why the disclosures of Monro and Yoneda should be combined.

Accordingly, for all the foregoing reasons, it is respectfully submitted that claim 1 and claim 2 dependent therefrom are in condition for allowance.

Claim 3 reads:

An exhaust smoke processing system comprising an air preheater for heating combustion air by exhaust smoke discharged from a boiler, a dust collector for collecting soot and dust in exhaust smoke discharged from the air preheater, and a wet-type exhaust smoke

processing apparatus for wet-type processing exhaust smoke discharged from the dust collector, wherein the system further comprises control means which measures a heavy metal concentration in exhaust smoke discharged from the wet-type exhaust smoke processing apparatus, and which adjusts any one or more of pH of liquid absorbent of the wet-type exhaust smoke processing apparatus, a flow rate of oxidizing-air, and a flow rate of waste water, such that the heavy metal concentration falls within a predetermined range.

Yoneda and Monro do not disclose nor suggest any means for measuring a heavy metal concentration in an exhaust gas that is discharged from the wet-type exhaust smoke processing, and adjusting any one or more of pH of liquid absorbent of the wet-type exhaust smoke processing apparatus, a flow rate of oxidizing-air, and a flow rate of waste water, such that the heavy metal concentration in the exhaust gas falls within a predetermined range. Accordingly, in addition to challenging the combination of Yoneda and Monro as improper, Applicant respectfully submits that the combination fails to teach or suggest all the limitations of claim 3. For at least these reasons, claim 3 should be allowed.

Claim 4 reads:

An exhaust smoke processing system comprising a air preheater for heating combustion air by exhaust smoke discharged from a boiler, a heat recoverer for heating a heat medium by exhaust smoke discharged from the air preheater, a dust collector for collecting soot and dust in exhaust smoke discharged from the heat recoverer, a wet-type exhaust smoke processing apparatus for wet-type processing exhaust smoke discharged from the dust collector, a reheater for heating exhaust smoke discharged from the wet-type exhaust smoke processing apparatus by the heat medium, and a heat medium circulation pipe passage for circulating the heat medium between the reheater and the heat recoverer, wherein the system further comprises control means which measures a heavy metal concentration in exhaust smoke discharged from the dust collector, and adjusts the temperature of exhaust smoke at an outlet of the heat recoverer such that the heavy metal concentration falls within a predetermined range, and which also measures the heavy metal concentration in exhaust smoke discharged from the wet-type exhaust smoke processing apparatus, and adjusts any one or more of pH of liquid absorbent of the wet-type exhaust smoke processing apparatus, a flow rate of oxidizing-air, and a flow rate of waste water, such that the heavy metal concentration falls within a predetermined range.

Yoneda and Monro do not disclose nor suggest many of the limitations of Claim 4, such as

- (i) “control means which measures a heavy metal concentration in exhaust smoke discharged from the dust collector”;
- (ii) “adjusts the temperature of exhaust smoke at an outlet of the heat recoverer such that the heavy metal concentration falls within a predetermined range”;
- (iii) “measures the heavy metal concentration in exhaust smoke discharged from the wet-type exhaust smoke processing apparatus”; and
- (iv) “adjusts any one or more of pH of liquid absorbent of the wet-type exhaust smoke processing apparatus, a flow rate of oxidizing-air, and a flow rate of waste water, such that the heavy metal concentration falls within a predetermined range”.

Accordingly, in addition to challenging the combination of Yoneda and Monro as improper, Applicant respectfully submits that claim 4 is allowable also because the applied combination fails to disclose or fairly suggest all the limitations of claim 4.

CONCLUSION

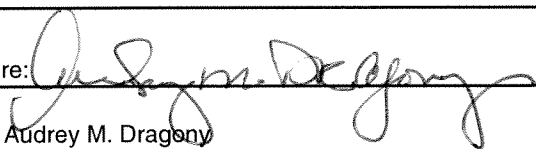
All formal and informal matters having been addressed, it is respectfully submitted that this application is in condition for allowance. If the Examiner is of the view that all of the pending claims of the application are not in clear condition for allowance, it is requested that the Examiner telephone the undersigned for purposes of conducting a telephone interview to resolve any differences. Accordingly, an early notice of allowance is earnestly solicited.

Respectfully submitted,

FAY SHARPE LLP

December 21, 2007
Date


Richard J. Minnich, Reg. No. 24,175
Erik J. Overberger, Reg. No. 48,556
1100 Superior Avenue, Seventh Floor
Cleveland, OH 44114-2579
216-861-5582

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